

REMARKS

Introduction

Claims 1, 3, 5-6 and 8-19 are pending, of which claims 11-13 have been withdrawn and claims 1 and 3 are independent. Claims 1, 3, 5-6 and 8 have been amended to correct informalities in the claim language and to more clearly define the claimed subject matter.

Claims 2, 4 and 7 have been cancelled without prejudice or disclaimer of the subject matter thereof. Claims 15-18 have been added. The amendments and the new claims are supported by, for example, Table 1 or paragraph [0014] of the present disclosure. No new matter has been introduced.

Claim Rejection – 35 U.S.C. § 112

Claim 1 was rejected under 35 U.S.C. § 112, second paragraph, as being indefinite. Applicants respectfully submit that the amendments made to claim 1 overcome this rejection.

Claim Rejection – 35 U.S.C. § 103

Claims 1-10 and 14 were rejected under 35 U.S.C. § 103(a) as being unpatentable over R &D Kobe Steel Technical Report (“Publication 1”) in view of Hiroshi Suzuki, ed., Plastic Processing (“Publication 2”) and further in view of the computer-generated English translation of Japanese Patent 2003-213372 (“JP ‘372”). Applicants respectfully traverse this rejection for at least the following reasons.

Applicants respectfully submit that none of the cited references disclose or suggest the steel wire comprising “C: 0.50-0.75%, Si: 1.80-2.70%, Mn: 0.1-0.7%, Cr: 0.70-1.50%, Co: 0.02-1.0%, and balance consisting of Fe and impurities,” as recited by amended claim 1 or the steel wire comprising “C: 0.50-0.75%, Si: 1.80-2.70%, Mn: over 0.7-1.5%, Cr: 0.70-1.50%, and

balance consisting of Fe and impurities without including Ni and V," as recited by amended claim 3.

It appears that Publication 1 discloses a steel wire (see, Developed Steel of Table 1 of Publication 1) consisting of, based on mass %, C: 0.59%, Si: 1.93%, Mn: 0.85%, Cr: 0.91%, Ni: 0.25% and V: 0.10%. It is clear that, at a minimum, Publication 1 does not disclose or suggest the steel wire comprising, among other elements, Si of 1.80-2.70 % and Mn of 0.7% or lower. Similarly, the remaining steel wire of Publication 1 does not have the composition of claim 1. As such, Publication 1 fails to disclose or suggest the steel wire of claim 1. Similarly, JP '372 fails to disclose the steel wire comprising, among other elements, Si of 1.80-2.70 % and Mn of 0.7% or lower (see, Table 1 of JP '372). It is also clear that Publication 2 fails to disclose any composition of a steel wire. Accordingly, it is clear that claim 1 and all claims dependent thereon are patentable over the cited references.

Regarding, claim 3, Applicants respectfully submit that Publication 1 and JP '372 fail to disclose the steel wire comprising "C: 0.50-0.75%, Si: 1.80-2.70%, Mn: over 0.7-1.5%, Cr: 0.70-1.50%, and balance consisting of Fe and impurities without including Ni and V. It is clear that Developed Steel of Publication 1 includes Ni and samples B(b) and C(c) of JP '372 include V or Ni as a component. Accordingly, it is clear that claim 3 and all claims dependent thereon are patentable over the cited references.

Further, Applicants respectfully submit that when steel wires have different compositions, the properties of the steel wires greatly change and the optimal austenitizing conditions, for example, drastically vary. While the steel wire of Publication 1 is produced by a patenting comprising an austenitization step in which the steel is heated at 950°C and an isothermal transformation step in which the steel is heated at 660°C for 70 minutes, Publication 1

does not disclose retention times for the austenitization. Additionally, JP '372 merely discloses that “[a] patenting condition with a heating temperature of 600°C and retention time of 40 minutes was set” (see, paragraph [0028] of JP '372) and fails to disclose the austenitizing conditions. As already mentioned, the compositions of the steel wire of Publication 1 are different from those of the claimed steel wires. Therefore, it would not have been obvious for one skilled in the art to set austenitizing condition of 900-1050°C and 60-180 seconds for the manufacturing step of the present disclosure. For example, Table 4 of the present disclosure shows evaluation results for the properties (reduction of area and shear yield stress) of the steel wires after subjected to the patenting under various conditions. The conditions III to VI (Samples No. 24-27) are the cases where the austenitizing conditions do not meet that of the present subject matter. As shown in Table 4, the austenitizing condition is indispensable to achieve the claimed reduction of area and the shear yield stress. As such, it would not have been obvious to modify the cited references to arrive at the claimed subject matter.

Based on the foregoing, Applicants respectfully submit that none of the cited references, taken alone or in any combination thereof, renders claims 1 or 3 or any claim dependent thereon obvious. Thus, it is requested that the Examiner withdraw the rejection of claims 1-10 and 14 under 35 U.S.C. § 103(a).

New Claims

Since the new claims 15-18 depend on claim 1 or claim 3, these claims are patentable over the cited references for at least the same reasons as claims 1 and 3.